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ROBERT W. WILSON

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The Paleocene condylarth genus *Ellipsodon* Scott 1892 (Family Hyopsodontidae) has as its type the rare species *Ellipsodon inaequidens* (Cope). The type specimen of *E. inaequidens* is poorly preserved, and the few other certainly referable specimens are fragmentary. After the initial collection was made by David Baldwin from the Torrejonian (middle Paleocene) rocks at Gallegos Canyon in the northern part of the San Juan Basin, New Mexico, only one specimen was subsequently found which has been referred to *E. inaequidens,* and this specimen only doubtfully (Matthew, 1937: 200; Simpson, 1937:233). If this doubtfully referred specimen is AMNH No. 17043, an upper dentition with P4-M2, from Bohannan Canyon, San Juan Basin, I concur with Simpson that the specimen is of highly dubious reference to *E. inaequidens.* Matthew lists AMNH No. 3299 as of doubtful reference, but the additional material described in this paper shows that assignment to *E. inaequidens* is correct. In Matthew's review of the Torrejon fauna in 1897, AMNH No. 3298 is assigned also to the species, but in his definitive memoir of 1937 no mention of this specimen is made. No. 3298 includes, as a matter of fact, material of *E. inaequidens,* but also one extraneous specimen.

The finding of only one specimen (doubtfully referred) additional to the original material suggests that the species is not only uncommon, but also that its remains occur in beds which have not been extensively prospected since the original collections were made by Baldwin for E. D. Cope. It is hence of considerable importance to record the obtaining of seven specimens of a species close to *E. inaequidens* from nearby Kutz Canyon by field parties of the University of Kansas. Several of these specimens were listed previously as *Ellipsodon* cf. *E. inaequidens* in Wilson, 1951. It now appears justifiable to name the species represented as new.

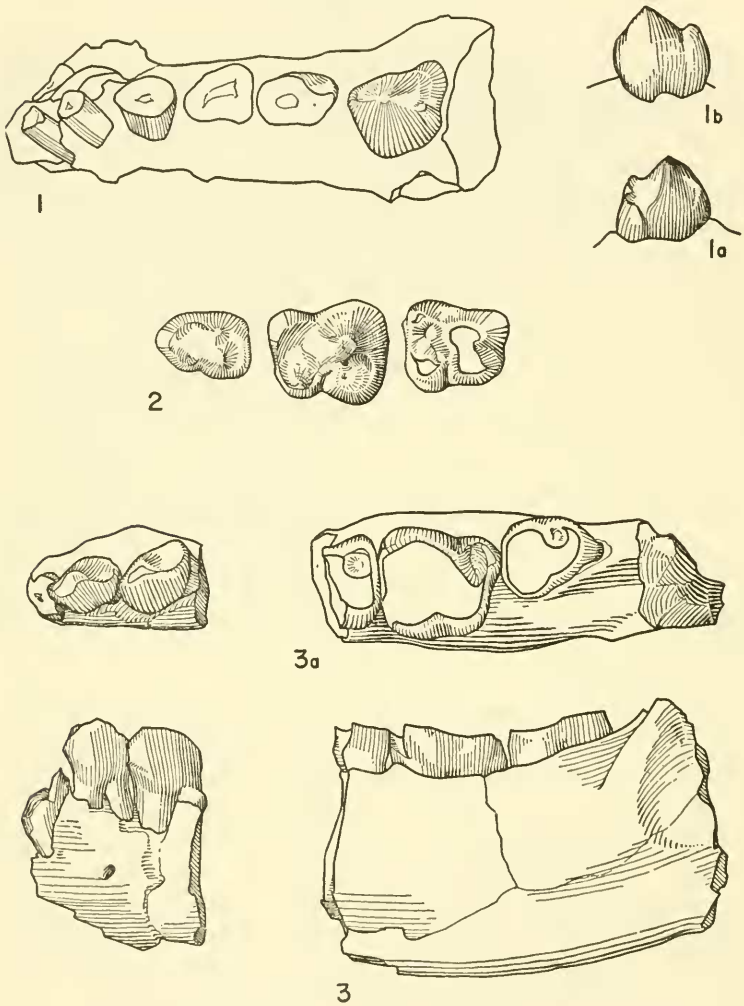
Ellipsodon grangeri new species

Ellipsodon cf. *E. inaequidens,* Wilson, 1951, pp. 6, 7.

Type specimen.—Fragmentary mandible with right m1-m3, left m3 (matrix covered). No. 7833.

Referred specimens.—Left M2 in fragment of maxillary, No. 9619; left ramus with m2-m3, No. 7834; right ramus with m2 and fragments of p4, No. 7835; left ramus with p4 and alveoli for more anterior teeth, right ramus with

alveoli for incisors, canine, and second premolar, No. 9618; left ramus with p2-p3, incomplete m1, m2-m3, right ramus with m1 and incomplete p4, No. 9616; right ramus with m2, No. 9617.



FIGURES 1-3. *Ellipsodon grangeri* new species, Torrejonian (middle Paleocene), Kutz Canyon, San Juan County, New Mexico.

FIG. 1. No. 9618, occlusal view of left lower jaw with p4 and roots of the more anterior teeth.

1a. Medial view of p4.

1b. Lateral view of p4.

FIG. 2. No. 7833 (type specimen), occlusal view of right m1-m3.

FIG. 3. No. 9616, lateral view of left lower jaw with root of c, p2-p3, incomplete m1, m2-m3.

3a. Occlusal view of same.

Drawings by Jane S. Mengel, all × 3.

Formation and Age.—Nacimiento formation, Torrejonian (middle Paleocene) age.

Locality.—Kutz Canyon, KUVP Loc. 13, San Juan County, New Mexico.

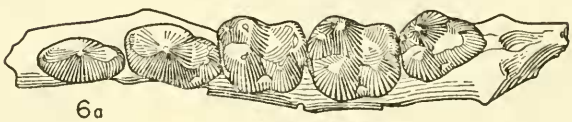
Specific characters.—Larger (17 per cent) than *E. inaequidens;* anteroexternal cingulum in m1 stronger, perhaps longer, entoconid perhaps less marginal and stronger; crown and cusps in m2 more inflated.

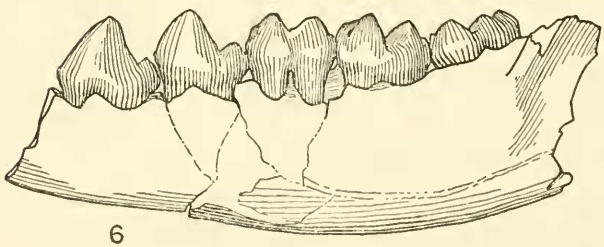
Description.—In No. 9618, the alveoli anterior to p4 are shown, and additional information as to the number and character of the teeth represented by these alveoli is furnished by No. 9616. Six teeth seem to represent the combined incisor, canine and premolar series. The posterior three of these teeth seem to be p2-p4, and at least the most anterior one is an incisor. I interpret the remaining two as an incisor and a canine. In any case, the dentition is reduced in comparison with that of *"E." acolytus* for here there is definite evidence of a complete dental formula (KU No. 7838). Even if an incisor has been missed in the count, the dentition of *Ellipsodon grangeri* is reduced. It is all but impossible that the complete formula was present.

The tooth immediately in front of p2 is regarded as the canine. It might be an enlarged p1, but this interpretation is not probable. The cross-section of the base of the crown is larger than in either of the two anterior teeth, and the root is large—larger than the root of the tooth immediately in front, and comparable in size to the combined roots of p2. The crown may be represented by a fragment—farther forward in the specimen—which lies imbedded in matrix between the ramal fragments. Only the lateral surface of this fragment is visible. This surface seemingly shows that the tip of the crown is far forward which may suggest a canine of *"E." lemuroides* type. Comparison of the fragment with the canines of *Mioclaenus turgidus, Coriphagus encinensis,* and *"E." acolytus* suggests a degree of reduction somewhat comparable to that in the three species last named. The roots of the two most anterior teeth are of approximately the same size and shape, but the more posterior is the larger. They are almost certainly incisor roots. In the right ramus of No. 9618, these teeth are anteroposterior in alignment; in the left ramus they are transverse. The latter is presumably the correct alignment in life.

The premolars are short, transversely widened, and have moderately inflated crowns. This inflation, however, is not enough to cause the crowns to bulge transversely. Inflation is distinctly less than in *Mioclaenus.* The general appearance of the crowns as viewed laterally is more like those of *Coriphagus* than of *"E." lemuroides* or *"E." acolytus,* but the crown patterns are basically those of

mioclaenines rather than anisonchines. Judging from No. 9616, the premolars are crowded and set somewhat obliquely in the jaw. In each of these three teeth there is only a single principal cusp. Small, but distinct, heels are present which are transversely expanded and are basined on the inner side. The size and distinctness of the basins progressively increase from p2 to p4. A distinct hypoconid is present on p4, but not on the others.





Figures 4-6. *Ellipsodon grangeri* (fig. 4) and *Promioclaenus acolytus* (Cope) (figs. 5-6), Torrejonian (middle Paleocene), Kutz Canyon, San Juan County, New Mexico.

Fig. 4. No. 9619, occlusal view of left M2.

Fig. 5. No. 7836, occlusal view of left M2. Compare with figure 4.

Fig. 6. No. 9626, lateral view of left lower jaw with p3-m3. Compare with figures 1b and 3.

6a. Occlusal view of same. Compare with figures 1, 2, and 3a.

Drawings by Jane S. Mengel, all $\times$ 3.

The lower molars, except for their larger size, closely resemble those of *Ellipsodon inaequidens*. Such differences as can be observed with the available specimens are as follows: (1) m1 of *E. grangeri* with longer, stronger anteroexternal cingulum, perhaps a stronger and less marginal entoconid; (2) m2 exceedingly close but the impression is gained that *E. grangeri* is somewhat more *Mioclaenus*-like in degree of inflation of crown and cusps—this feature might be a function of size; m3 shows no differences which can be regarded as significant.

The mandible is short and stout. Three mental foramina are present. The anterior one lies beneath the posterior root of p2, the median one beneath the anterior root of p3, and the posterior foramen beneath the space between p4 and m1.

A maxillary fragment bearing M2, No. 9619, gives the only information concerning the upper dentition of *Ellipsodon grangeri*. There are no noteworthy differences from *E. inaequidens* save size. My specimen has an anteroposterior diameter of 4.8 mm., and a transverse diameter of 7.1 mm. Both species have the external cingulum reduced to a remnant between paracone and metacone. Unlike M2 of "E." *acolytus*, the metaconule is absent. The alveolus of M3 is present in No. 9619. This socket indicates that M3 was much reduced.

TABLE 1.—MEASUREMENTS (in millimeters) OF ELLIPSODON GRANGERI

	p4		m1		m2		m3	
	L	W	L	W	L	W	L	W
7833			4.7	4.0	5.2	4.7	4.2	2.9
7834					4.8	4.8	4.1	3.0
9617					5.4	4.4		
7835					5.2—	4.2		
9618	4.0	3.1						
9616		3.5?	4.3	4.0	5.1+	4.8	4.2	3.4

Relationships of Ellipsodon grangeri.—Although several species other than the type have been assigned previously to the genus *Ellipsodon*, the best known of which are *E. acolytus*, *E. lemuroides*, and *E. aquilonius*, these are generally unlike *E. inaequidens* in several structures, and Simpson (1937:234) warned that, "the fact that the genus is known principally from these atypical species may mean that its true nature, as based on *E. inaequidens*, is now seriously misunderstood." Our new material establishes the structure

of p2-m3 inclusive, and almost certainly establishes the dental formula of the lower dentition. It is clear that none of the species named above can be included in *Ellipsodon*. Those that remain are the type species *E. inaequidens, E. grangeri,* and possibly *E.? sternbergi.*

Before presenting a formal diagnosis of the genus *Ellipsodon,* it is well to note that Cope interpreted the upper dentition of the type of *E. inaequidens* as having the first premolar minute or absent, and the canine moderately large. Matthew (1897:316) thought it possible that P1 was spaced, probably displaced, and the canine unknown—thus bringing the dental formula into harmony with that of other Mioclaeninae. I am unable to determine the formula in the type specimen, but that Cope's formula is correct is suggested by the evidence of the lower dentition.

The genus *Ellipsodon* Scott, 1892, may now be diagnosed as follows: Dentition $\frac{1}{2?}$, $\frac{1}{1}$, $\frac{3?}{3}$, $\frac{3}{3}$. Molar paraconids internal, but usually nearly if not entirely indistinguishable. Entoconids indistinguishable from hypoconulids, reduced to a low, bordering rim. Reduction of M3/m3 extreme. Molar trigonid cusps (m1-m2) closely appressed, turgid. Lower jaws short and stout. Premolars short and wide, crowded (obliquely set in rami), simple with basins of heels shallow and poorly defined but wide. Species: *E. inaequidens* (type), *E. grangeri, E.? sternbergi.*

Ellipsodon? sternbergi of the Dragon fauna seems to be older geologically than either *E. inaequidens* or *E. grangeri.* The two last-mentioned are nearly of the same age, but probably are not contemporaneous. *E.? sternbergi* agrees in size with *E. grangeri,* but is less advanced in reduction of paraconid, stage of adpression of trigonid cusps, and reduction of inner rim of heel in the molars. *E.? sternbergi* probably is a somewhat primitive species of *Ellipsodon* although as Gazin indicates a small species of *Mioclaenus* possibly is represented (he also considers a possible relationship to *Jepsenia*).

A large variant of *Ellipsodon grangeri* or an unnamed species of *Ellipsodon* or *Mioclaenus* is represented by KU No. 9521. This specimen was obtained with a relatively large collection of other mammals in Kimbetoh Arroyo, and is representative of the *Deltatherium* fauna of Osborn. It consists of a left ramus with m2 and incomplete m1. Certain features, such as the presence of a paraconid, suggest that this specimen represents a small species of *Mioclaenus* rather than a species of *Ellipsodon.* USNM No. 15781, a lower jaw from the Dragon, was named *Ellipsodon?* species (a)

by Gazin, and he states that it resembles somewhat the Torrejon species referred to *E. inaequidens*. It probably is related to it. Finally, USNM No. 16333, an upper molar, has been identified by Gazin as possibly pertaining to *E.? sternbergi*. It is slightly smaller than our only upper molar, the metaconule is more prominent, and the external cingulum more developed although the posteroexternal cingulum is absent in both.

From *E. inaequidens*, *Ellipsodon grangeri* differs chiefly in larger size. It is possibly slightly more advanced otherwise. Interpretation of an ancestor-descendant relationship turns on unknown stratigraphic relationships. If the Gallegos beds are older, then *E. grangeri* has progressed slightly in regard to size, but if a reverse stratigraphic relation holds, *E. inaequidens* can be viewed as a slightly dwarfed descendant. *E. grangeri* is hardly a geographic variant of *E. inaequidens*—the known localities are too close together—unless geographic distribution has become changed with time.

The differences which separate *Ellipsodon inaequidens* and *E. grangeri* are so slight (an average size difference of 17 per cent is not in itself definitive) that it might have been advisable to treat *E. grangeri* as only a temporal subspecies. The decision to regard them as fully distinct was made because no overlap in size is recorded in the thirteen known specimens of the two species.

Classification of Mioclaeninae.—Simpson (1945:123) has classified as Mioclaeninae the genera *Tiznatzinia, Choeroclaenus, Mioclaenus, Ellipsodon, Litaletes,* and *Jepsenia.* Of these, *Mioclaenus, Ellipsodon, Litaletes*, and *Jepsenia* are of Torrejonian age.

It has never been too satisfactory an arrangement to include in *Ellipsodon* as many and varied species as has been done. With increased information concerning the morphology of *Ellipsodon* as a result of the finding and naming of *E. grangeri,* it becomes evident that several of the species can no longer be assigned to the genus. These are *E. shephardi, E. aquilonius, E. acolytus, E. lemuroides,* and presumably also the poorly known *E. aequidens.* (*E. priscus* of the Puercan has been previously assigned to *Tiznatzinia* by Simpson, 1936:8.) *E. shephardi, E. aquilonius* and *E. acolytus* form a group of closely related species. *E. lemuroides* is somewhat more removed, but evidently allied. Review of the opinions expressed by Matthew, Simpson, and Gazin make it seem unlikely that this group of four species can be referred to any genus named in the preceding paragraph or that the species can be distributed among the several listed genera.

Simpson, who has presented us with the most thorough review of the Mioclaeninae states (1937:233), "*Ellipsodon aquilonius* . . . closely resembles *E. acolytus*. The latter is fairly close to *E. lemuroides*, which in turn approaches *E. inaequidens*. There is no logical or convenient separation, probably of more than specific rank, in this series of four species, yet *E. aquilonius* is markedly unlike *E. inaequidens*, which is the type of the genus." Farther on he says (*op. cit.*:234), "In general aspect, *E. aquilonius* resembles some of its associates such as *Litaletes disjunctus* more than it does *Ellipsodon inaequidens*, but in structural detail it seems closer to *Ellipsodon acolytus* and is conservatively associated with that species generically (rather than definitely with the type of *Ellipsodon*)." Thus it seems that the removal of *E. inaequidens* from this group does not alter the relationship of the remaining species sufficiently to warrant referring all three (or only *E. aquilonius* and *E. acolytus*) to *Litaletes* although this remains a possibility. Gazin indicates that *E. shephardi* is closer to the cluster of these species than to *Litaletes* (1941:29).

An important and additional reason for not referring *E. aquilonius, acolytus, lemuroides,* and *shephardi* to *Litaletes* is the presence of a *Litaletes*-like species in the Puercan (early Paleocene). This species (represented by KU Nos. 9446, 9447) is smaller than *L. disjunctus*, but in the upper dentition does not otherwise differ—at least not at a generic level. In the lower dentition, the premolars are narrower (partly the result of crushing?), paraconids and metaconids of p3-p4 are of lesser development; the molars have larger hypoconulids, and are more distinctly separate from entoconids. The presence of this species contemporaneous with a species (*Tiznatzinia priscus*), which is close to the ancestry of *E. acolytus* suggests a dichotomy sufficiently important to be recognized by generic separation of the Torrejonian species.

Jepsenia mantiensis is said by Gazin (1941:32) to be closer to *Litaletes disjunctus* than to any of the above mentioned species. Further, *Ellipsodon shephardi* is regarded by him as generically distinct from species of *Jepsenia*, and hence by inference the latter is distinct from all those obviously closely related to *E. shephardi*. Thus his taxonomy suggests as does that of Simpson the inadvisability of referring the species previously assigned to *Ellipsodon* to either of the generic groups named *Jepsenia* by Gazin and *Litaletes* by Simpson. Nevertheless, it is possible that such may eventually prove to be the correct procedure. I propose, however, that the species *E. lemuroides, E. acolytus, E. aquilonius,* and *E. shephardi*

be grouped together as a generic assemblage distinct from these groups. For this assemblage, the name *Promioclaenus* Trouessart, 1904, seems to be available although never mentioned by classifiers of the Mioclaeninae. Trouessart included in his nominal genus only *P. acolytus* and *P. lemuroides*. *P. acolytus* was listed first, but he did not select a typical species. To remedy this omission, I select *Mioclaenus lemuroides* as type of the genus *Promioclaenus*. The type species is somewhat aberrant with respect to the others. It is selected rather than the otherwise taxonomically preferable *P. acolytus* because *P. lemuroides* is less likely, at some future date, to have a type species of another and later-named genus (such as *Litaletes* or *Jepsenia*) associated with it—a reason which I think is of some practical worth in the present instance.

The diagnosis of *Ellipsodon* given by Simpson (1937:226-227) is essentially of *Promioclaenus*. As modified by the removal of *E. inaequidens*, it may be restated as follows:

Promioclaenus Trouessart, 1904

Type.—*Mioclaenus lemuroides* Matthew 1897.

Distribution.—Torrejonian of Nacimiento formation, New Mexico; Lebo formation, Montana; Joes Valley member of North Horn formation, Utah.

Diagnosis.—Dentition $\frac{?}{3}, \frac{1}{1}, \frac{4}{4}, \frac{3}{3}$. P1 caniniform. $p\frac{4}{4}$ cuspidate, more or less enlarged, but not really inflated. The p4 without distinct paraconid, metaconid absent or rudimentary, protoconid inflated rather than bladelike; talonid basined and relatively large. Molar hypocones weak (or absent?), metaconules present. Molar trigonids with paraconids internal, fusing with metaconids; moderately separated metaconids and protoconids. Molar talonids with relatively wide basins, entoconids generally indistinct and fusing with hypoconulids (especially on m2). $m\frac{3}{3}$ moderately reduced. M3 with reduced metacone. Rami relatively long and slender.

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